

**CERTIFICATE OF COMPLIANCE
FOR RADIOACTIVE MATERIAL PACKAGES**

1.	a. CERTIFICATE NUMBER 9979	b. REVISION NUMBER 1	c. DOCKET NUMBER 71-9979	d. PACKAGE IDENTIFICATION NUMBER USA/9979/AF-96	PAGE 1	OF 4	PAGES
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2. PREAMBLE

- a. This certificate is issued to certify that the package (packaging and contents) described in Item 5 below meets the applicable safety standards set forth in Title 10, Code of Federal Regulations, Part 71, "Packaging and Transportation of Radioactive Material."
- b. This certificate does not relieve the consignor from compliance with any requirement of the regulations of the U.S. Department of Transportation or other applicable regulatory agencies, including the government of any country through or into which the package will be transported.

3. THIS CERTIFICATE IS ISSUED ON THE BASIS OF A SAFETY ANALYSIS REPORT OF THE PACKAGE DESIGN OR APPLICATION

- a. ISSUED TO (*Name and Address*)
Savannah River Nuclear Solutions
P.O. Box A
Aiken, SC 29808
- b. TITLE AND IDENTIFICATION OF REPORT OR APPLICATION
Safety Analysis Report Model 9979 Type AF Shipping
Package application, Revision No. 1, as supplemented.

4. CONDITIONS

This certificate is conditional upon fulfilling the requirements of 10 CFR Part 71, as applicable, and the conditions specified below.

5.

(a) Packaging

- (1) Model No.: 9979
- (2) Description

The Model No. 9979 package is composed of one 55-gallon drum overpack and one 30-gallon inner drum.

The 55-gallon drum and its lid, fabricated from 16-gauge carbon steel, include a welded steel liner containing a polyurethane foam for thermal insulation and structural support. When installed, the lid assembly extends into the drum body liner. An EPDM gasket seals the overpack closure. The 30-gallon inner drum, fabricated from 16-gauge carbon steel, is positioned centrally, both radially and axially, within the 55-gallon drum overpack steel liner. The inner drum, which secures the radioactive contents payload, is the containment boundary for the package. A silicon gasket seals the 30-gallon containment drum closure.

Reinforced split-ring devices, fabricated from 12-gauge carbon steel, provide secure closures for both the 30-and 55-gallon drums. Tamper Indicating Devices (TID) can be inserted through the lugs welded at each end of the two split-rings for both the 55-and 30-gallon drums.

Two thermal insulation components, made of a ceramic fiber mat sandwiched and sewn between flexible fiberglass woven cloth, are added to the packaging: a quilted insulation cover, 21 ½ inches in diameter by ½ inch thick is positioned between the 30-gallon and 55-gallon drum closure lid and an insulation bag is installed in the 30-gallon drum.

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The 55-gallon drum is nominally 23 inches in diameter and 34 ½ inches in height. The nominal weight of the overpack (body, closure lid and split-ring closure device) is 174.5 lb. The 30-gallon drum is nominally 18.6 inches in diameter and 29 inches in height. The 30-gallon drum with its lid and the split-ring closure weighs approximately 50 lbs.

The gross weight of a fully loaded package shall not exceed 415 lb.

(3) Drawings

The package is constructed in accordance with the following drawings:

- Drawing No. R-R1-G-00026, 9979 Type AF 30-Gallon Container Split Ring Assembly (U), Rev. 5.
- Drawing No. R-R1-G-00027, 9979 Type AF 55-Gallon Drum Lid Split Ring Assembly (U), Rev. 5.
- Drawing No. R-R1-G-00028, 9979 Type AF 30-Gallon Drum Assembly (U), Rev. 5.
- Drawing No. R-R1-G-00029, 9979 Type AF 55-Gallon Drum Assembly (U), Rev. 5.
- Drawing No. R-R1-G-00030, 9979 Type AF Packaging Assembly (U), Rev. 3.
- Drawing No. R-R2-G-00057, 9979 Type AF 55-Gallon Drum Sub-Assembly and Weldment (U), Rev. 9.
- Drawing No. R-R2-G-00058, 9979 Type AF 30-Gallon Drum (U), Rev. 3.
- Drawing No. R-R2-G-00059, 9979 Type AF 55-Gallon Drum Lid Sub-Assembly and Weldment (U), Rev. 6.
- Drawing No. R-R2-G-00060, 9979 Type AF 30-Gallon Drum Lid with Dual Bung Closures (U), Rev. 4.
- Drawing No. R-R4-G-00062, 9979 Type AF 30-Gallon Drum Lid Gasket (U), Rev. 3.
- Drawing No. R-R4-G-00064, 9979 Type AF Insulation Bag, Rev. 3.
- Drawing No. R-R4-G-00065, 9979 Type AF Insulation Cover Assembly for 30-Gallon Drum, Rev. 3.
- Drawing No. R-R4-G-00163, 9979 Texas A&M AGN 30-Gallon Drum Payload Insert (U), Rev. 1.
- Drawing No. R-R4-G-00164, 9979 Texas A&M AGN 30-Gallon Drum Foam Spacers (U), Rev. 1.

5.
(b) Contents

(1) Type and form of material

AGN UO ₂ Fuel Form	Size (cm)
Four disks numbered 20497, 20498, 20499 and 204100	Ø25.6 x 4
Three disks numbered 204101, 204102, and 204103	Ø25.6 x 2
Two disks numbered 204104 and 204105	Ø25.6 x 1
One core fuse	Ø3.2 x 1.3
Two safety rods	Ø4.8 x 16
One course rod	Ø4.8 x 16
One fine rod	Ø2.51 x 16

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(2) Maximum quantity of material per package:

Material	Mass (g)
U-235	300
U-238	1,200
Carbon	1,000
Hydrocarbon, e.g., polyethylene, plastics	unlimited
Radioactive material	1,500
Package payload	90,000

(3) Maximum weight of contents:

90 kg.

The AGN contents are contained within and separated by flexible polyurethane disks, as specified on Drawing No. R-R4-G-00164.

Contents are specified to be all material within the 30-gallon drum, including the radioactive and non-radioactive content materials, such as polyethylene and aluminum, the insulation bags, and the dunnage, e.g., polyurethane foam disks.

(4) Maximum decay heat: 1.0 milliwatts

6. The Criticality Safety Index (CSI) is 1.0.
7. Moisture within the payload is limited to a maximum of one weight percent. No free liquid is permitted.
8. All contents and packing/dunnage shall be packaged within a thermal insulation bag in the 30-gallon drum.
9. In addition to the requirements of Subpart G of 10 CFR Part 71:
 - (a) The package shall be prepared for shipment and operated in accordance with the Operating Procedures in Section 7 of the application; and
 - (b) The package must meet the Acceptance Tests and Maintenance Program of Section 8.0 of the application.
10. Package may be shipped as non-exclusive use conveyance. For shipments under this certificate, the package identification number on the nameplate of existing packages shall have the "DOE" marking covered.
11. Transport of fissile material by air is not authorized.

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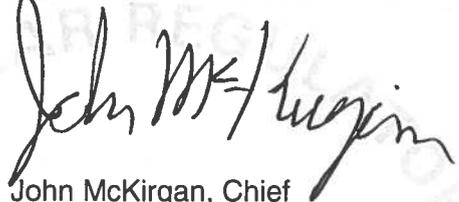
12. The package authorized by this certificate is hereby approved for use under the general license provisions of 10 CFR 71.17.
13. Expiration date: August 31, 2021.

REFERENCES

Safety Analysis Report Model 9979 Type AF Shipping Package application, S-SAR-G-00002, Revision No.1, dated July 17, 2016.

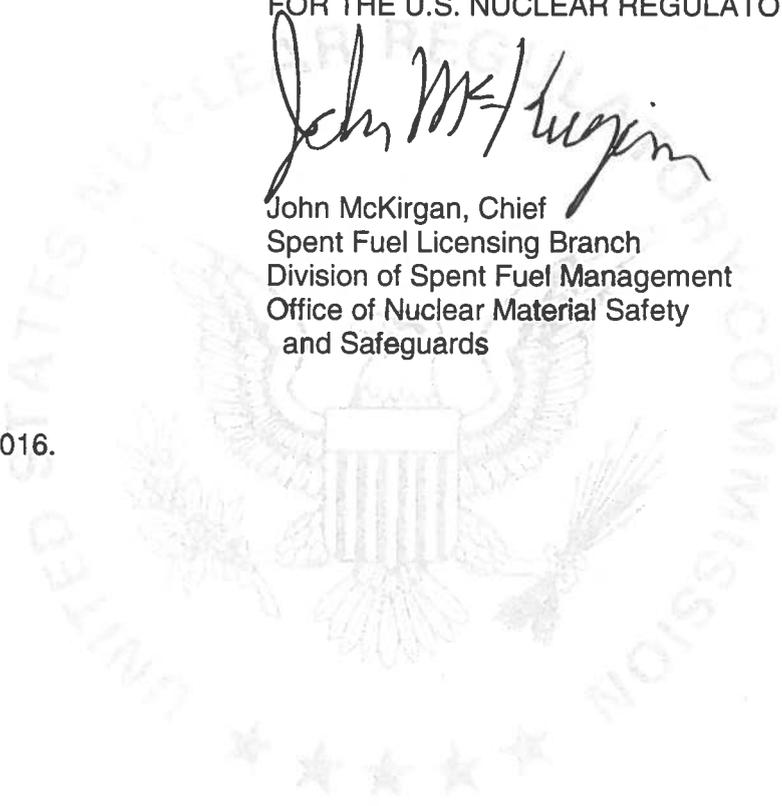
Supplement dated September 15, 2016.

FOR THE U.S. NUCLEAR REGULATORY COMMISSION



John McKirgan, Chief
Spent Fuel Licensing Branch
Division of Spent Fuel Management
Office of Nuclear Material Safety
and Safeguards

Date: September 20, 2016.



SAFETY EVALUATION REPORT

Docket No. 71-9979
Model No. 9979 Package
Certificate of Compliance No. 9979
Revision No. 1

SUMMARY

By letter dated September 15, 2016, Savannah River National Laboratory (SRNL or the applicant) requested a revision to Certificate of Compliance (CoC) No. 9979 for the Model No. 9979 package.

There were no changes to the packaging design, but the applicant requested a lower mass limit for the drum polyurethane foam.

CoC No. 9979 has been amended based on the statements and representations in the application, and staff agrees that the changes do not affect the ability of the package to meet the requirements of Title 10 of the *Code of Federal Regulations* (10 CFR) Part 71.

EVALUATION

The applicant submitted an amendment request to change Note 3 on licensing drawing No. R-R2-G-00057, Rev. 8, and make a related page change in Appendix 1.1-ii of the application. No other changes were requested.

Note 3 of drawing No. R-R2-G-00057, Rev. 8, specifies an acceptable range for the mass of the polyurethane foam in the 55-gallon drum as being between 54 and 59 lbs. The original acceptable polyurethane foam mass range of 47 to 59 lbs had been reduced to a range of 54 to 59 lbs in an attempt to remove any unnecessary foam mass tolerance. However, two of the four packagings being assembled for use under CoC No. 9979, Rev. 0, have a foam mass slightly under the specified lower limit of 54 lbs in Note 3 of the licensing drawing, i.e., 53.9 lbs and 53.8 lbs, respectively.

The applicant explained that the range for the foam mass is specified to control the package weight and provide an indication that the drum is completely filled with polyurethane foam. Although the foam mass is generally predictable, there are variations due to temperature (drum and foam chemicals), humidity, drum volume, free-rise density, number of pours and other parameters. The applicant stated that the free-rise, measured each day, when chemical components are changed, or if changes are made to the process, has not been altered since fabrication of the packaging began.

The staff notes that the total payload of the contents authorized in this CoC is about half of the maximum payload weight allowed (109.8 lbs versus 200 lbs). Considering that there is no safety concern about the minimal decrease of the package weight due to the lower foam mass, the staff finds that the proposed mass limit of 52 lbs will provide an equivalent level of

safety than that demonstrated during the normal conditions of transport and hypothetical accident conditions, as previously evaluated.

Based on the statements and representations in the application, and the conditions listed in the CoC, the staff concludes that the design has been adequately described and evaluated, and meets the requirements of 10 CFR Part 71.

CONDITIONS

The following change is included in Revision No. 1 to Certificate of Compliance No. 9979:

Condition No. 5(a)(3) has been revised to include Revision No. 9 of the licensing drawing No. R-R2-G-00057.

The expiration date of the certificate is not changed.

The September 15, 2016, amendment request letter, including its attachments, is referenced in the Reference Section of this certificate.

CONCLUSION

Based on the statements and representations in the application, and the conditions listed above, the staff concludes that the Model No. 9979 package design has been adequately described and evaluated and that these changes do not affect the ability of the package to meet the requirements of 10 CFR Part 71.

Issued with Certificate of Compliance No. 9979, Revision No. 1, on September 20, 2016.